

Upper Pliocene Fan 2 Play

UP F2, #0982

Buliminella 1

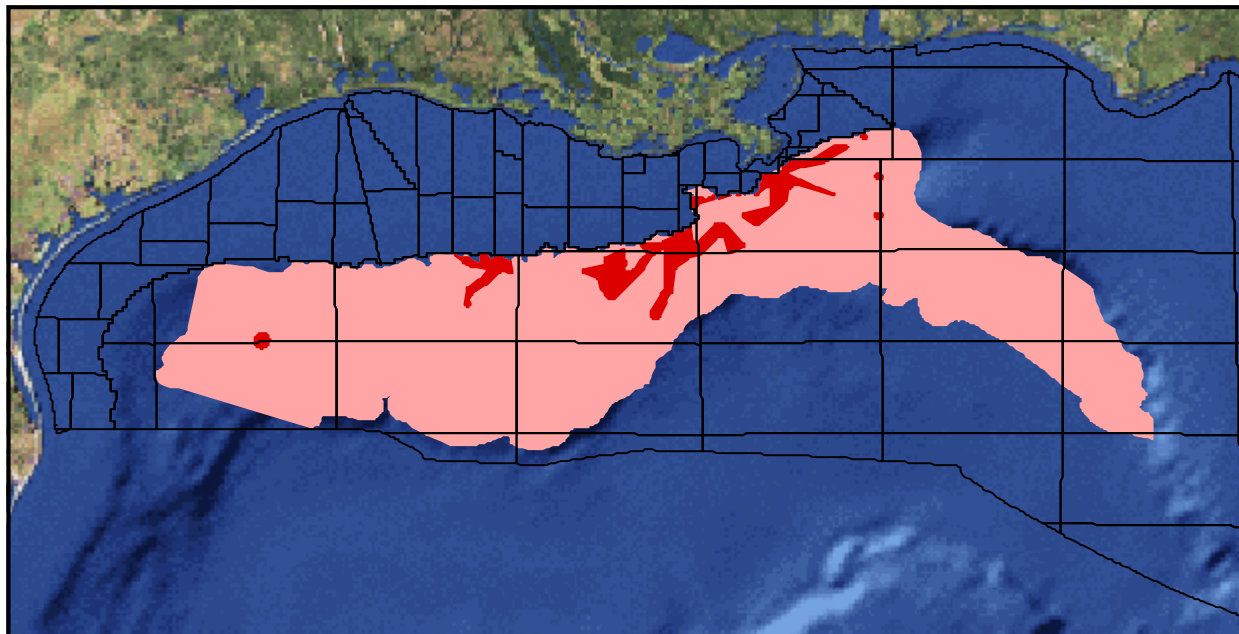


Figure 180. UP F2 map showing location of play. Play limit shown in light red; hydrocarbon limit shown in dark red.

Overview

The Upper Pliocene Fan 2 Play (UP F2) contains reserves of 2,056.810 Bcfg and 830.826 MMbo (1,196.807 MMBOE) in 75 sands in 23 fields. Comparing the nine F2 fan plays in the GOM, UP F2 ranks second in gas reserves (16%) and third in oil reserves (24%). The play extends continuously across the modern GOM slope from the East Breaks and Alaminos Canyon to Destin Dome and western Desoto Canyon Areas, and to the south and east of the Desoto Canyon Area to the Henderson and Vernon Basin Areas ([Figure 180](#)).

Description

UP F2 is defined by (1) a deep-sea fan depositional style representing sediments deposited basinward of the UP shelf edge, (2) a structural regime of allochthonous, small salt sheets or large salt canopies with intervening salt-withdrawal basins on the western and central GOM slope and high relief salt structures on the southeastern GOM slope, and (3) the UP Chronozone, the top of which is defined by the *Buliminella 1* biozone ([Figure 8](#)).

UP F2 extends continuously downdip of the modern GOM shelf edge from the East Breaks and Alaminos Canyon Areas to the southwestern Destin Dome and western Desoto Canyon Areas east of the modern Mississippi River Delta, and south and east of the Desoto Canyon Area to the Henderson and Vernon Basin Areas ([Figure 180](#)). Hydrocarbons have been found mainly in the Garden Banks, Green Canyon, Ewing Bank, and Mississippi Canyon Areas. Located on the modern GOM slope, UP F2 is not nearly as well explored as plays on the modern shelf. The UP interval is very thick in the Garden Banks and Green Canyon Areas, and probably to the south of these areas as well.

The ancestral Mississippi River Delta System dominated deposition of the play's sediments. The depocenter present in the offshore Texas area no longer received significant amounts of sand-rich sediments during UP time (Morton et al., 1985).

Play Limits

UP F2 is limited updip by the Upper Pliocene Fan 1 Play (UP F1) and by the deposits of the Upper Pliocene Progradational Play (UP P1). To the east,

the play onlaps the lower Cretaceous carbonate slope. Downdip in the western and central GOM, UP F2 is limited by the farther downdip occurrence of either (1) the Sigsbee Salt Canopy Escarpment, where the farthest extent of large salt bodies overrides the abyssal plain or (2) the downdip limit of the Perdido Fold Belt and Mississippi Fan Fold Belt Plays. Downdip in the eastern GOM, UP F2 is limited by the southern extent of Louann Salt deposition, as defined by the downdip extent of the Salt Roller/High-Relief Salt Structure Play (UK5-UJ4 S1) (Lore et al., 2001).

Depositional Style

UP F2 is characterized by deep-sea fan systems deposited basinward of the UP shelf edge. Component facies include channel/levee complexes, sheet-sand lobes, interlobe/fringe sediments, and slump sediments that were deposited on the UP upper and lower slope, in topographically low areas between salt structure highs, and abyssal plain. These deep-sea fan systems are often overlain by thick shale intervals representative of zones of sand bypass on the shelf, or sand-poor zones on the slope.

The UP deep-sea fan interval varies from approximately 50 to more than 12,800 ft in thickness, with net sand thicknesses as much as approximately 2,600 ft. Sand-dominated successions comprising deposits of multiple sheet-sand lobes are more than 1,000 ft thick, with intervening shale sequences reaching as much as several thousands of feet in thickness. Thick, upward-coarsening and thinner, upward-fining log patterns of sand-dominated intervals represent sheet-sand lobe progradation and channel fill/abandonment, respectively, in proximal-fan areas. Interstratified shales are typically only a few hundred feet thick and suggest deposition in distal-fan areas.

Structural Style

Over half of the fields in UP F2 are structurally associated with salt bodies with hydrocarbons trapped on salt flanks or in sediments draped over salt. Other fields are structurally associated with anticlines, while some fields contain hydrocarbon accumulations trapped by permeability barriers and updip pinchouts or facies changes.

Quantitative Attributes

On the basis of reserves calculations, UP F2 is 69% oil and 31% gas. The 75 sands in the play comprise 118 reservoirs, of which 32 are nonassociated gas, 74 are undersaturated oil, and 12 are saturated oil. Proved reserves are estimated at 1,924.520 Bcfg and 750.027 MMbo (1,092.468 MMBOE) in 56 sands in 15 fields ([Table 83](#)). Unproved reserves are estimated at 132.290 Bcfg and 80.799 MMbo (104.338 MMBOE) in 19 sands in 8 fields. These proved plus unproved reserves account for 23% of the reserves for the UP Chronozone.

	No. of Sands	Oil (MMbbl)	Gas (Bcf)	BOE (MMbbl)
Proved	56	750.027	1,924.520	1,092.468
Cum. production	41	320.973	971.052	493.758
Remaining proved	46	429.054	953.469	598.711
Unproved	19	80.799	132.290	104.338

Table 83. UP F2 reserves and cumulative production.

Cumulative production from UP F2 totals 971.052 Bcfg and 320.973 MMbo (493.758 MMBOE) from 41 sands in 11 fields. UP F2 production accounts for 13% of the UP Chronozone's total production. Remaining proved reserves in the play are 953.469 Bcfg and 429.054 MMbo (598.711 MMBOE) in 46 sands in 14 fields.

[Table 84](#) summarizes that water depths of the fields in UP F2 range from 663-4,851 ft, and play interval discovery depths vary from 3,700-23,438 ft, subsea. Additionally, porosity and water saturation range from 23-36% and 16-59%, respectively.

75 Sands	Min	Mean	Max
Water depth (ft)	663	1,778	4,851
Subsea depth (ft)	3,700	12,097	23,438
Reservoirs per sand	1	2	7
Porosity	23%	30%	36%
Water saturation	16%	28%	59%

Table 84. UP F2 sand attributes. Values are volume-weighted averages of individual reservoir attributes.

Exploration History

UP F2 has a 24-year history of discoveries ([Figure 181](#)). The first sands in the play were discovered in 1975 in the Mississippi Canyon 148 and Mississippi Canyon 194 (Cognac) Fields. The 10 sands discovered in these two fields in 1975 account for the maximum yearly reserves of

290.649 MMBOE being added to the play. However, the maximum number of sands discovered in any year occurred in 1991 with 12 sands from four fields. Over half of the sands in the play have been discovered in the 1990's, reflecting the recently increasing deepwater GOM exploration.

The largest sand in the play was discovered in 1987 in the Garden Banks 426 Field (Auger) and contains an estimated 150.591 MMBOE (Figure 182). One other 100-plus MMBOE sand was found in the play in the Cognac Field in 1975. The mean sand size for the play is 15.957 MMBOE. Since the first Atlas database cutoff of January 1, 1995, 18 sands have been discovered, the largest of which is estimated to contain 83.644 MMBOE in the Alaminos Canyon 25 Field (Hoover).

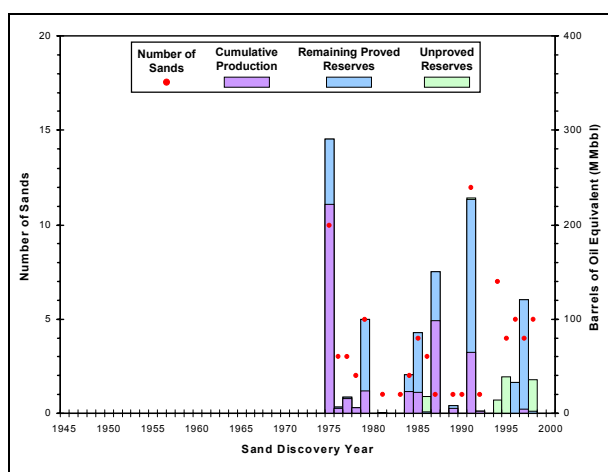


Figure 181. UP F2 exploration history graph showing reserves and number of sands discovered by year.

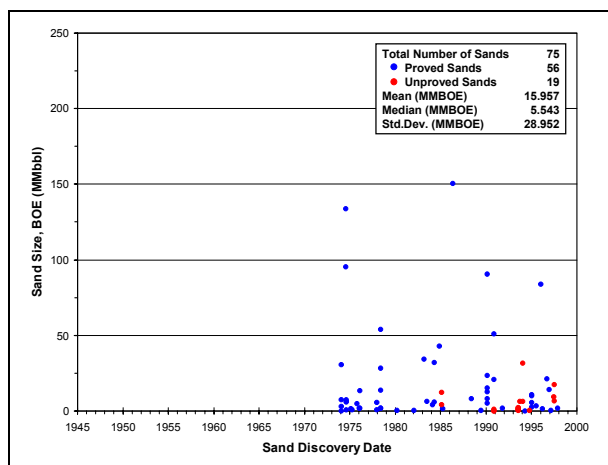


Figure 182. UP F2 sand discovery graph showing the size of sands discovered by year.

Production History

UP F2 has a 20-year history of production (Figure 183). Oil and gas production began in 1979. Oil production increased to a local peak in 1983. Subsequently, oil production declined drastically, reaching its lowest yearly level in 1990, when the Cognac Field ceased production for workover procedures. Then, with the re-establishment of Cognac production in 1991, yearly oil production values increased to their highest level in 1995. Since then, yearly values have decreased slightly. Gas production shows a similar trend to that of oil production, but without the extreme fluctuations.

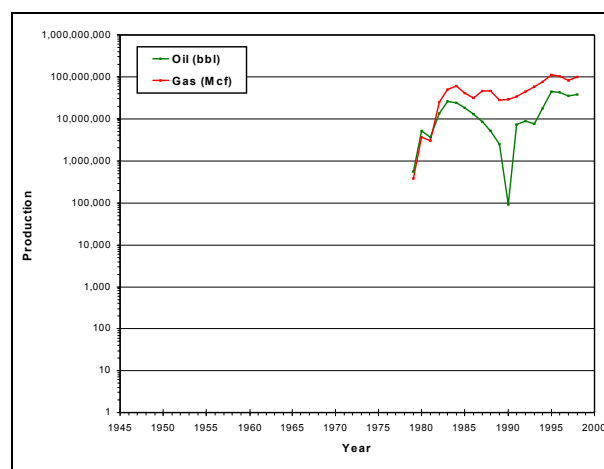


Figure 183. UP F2 production graph showing oil and gas production by year.